इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 2972-1 (1979): Textile motors, Part 1: Loom motors [ETD 15: Rotating Machinery]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN
IGNORANTIA JURIS NON EXCUSAT
PROTECTED BY COPYRIGHT

IS : 2972 (Part I) - 1979

Indian Standard

SPECIFICATION FOR TEXTILE MOTORS

PART I LOOM MOTORS

(*First Revision*)

UDC 621·313·333·2·025·3 : 677·054·4

© *Copyright* 1980

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Rs 8·50 Gr 5

August 1980

Indian Standard
SPECIFICATION FOR TEXTILE MOTORS
PART I LOOM MOTORS
(First Revision)

Rotating Machinery Sectional Committee, ETDC 15

Chairman	*Representing*
Shri J. S. Zaveri	Bharat Bijlee Ltd, Bombay
Members	
Shri S. G. Deshmukh (*Alternate* to Shri J. S. Zaveri)	
Shri T. Appaswamy	NGEF Ltd, Bangalore
Shri A. N. Srivathsa (*Alternate*)	
Shri P. R. Bapat	Guest, Keen, Williams Ltd, Bombay
Shri A. S. Abhyankar (*Alternate*)	
Shri S. S. Bijlani	Walchandnagar Industries Ltd, Walchandnagar
Shri A. G. Doshi (*Alternate*)	
Chief Engineer (E)-II	Central Public Works Department, New Delhi
Surveyor of Works II (*Alternate*)	
Director (HED-1)	Central Electricity Authority, New Delhi
Deputy Director (HED-1) (*Alternate*)	
Deputy Director of Weapon Equipment	Naval Headquarters
Assistant Director Electrical Engineering (*Alternate*)	
Deputy Director of Inspection	Directorate General of Supplies & Disposals, New Delhi
Shri J. S. Passi (*Alternate*)	
Joint Director Standards (Elect)-I, RDSO	Railway Board (Ministry of Railways)
Deputy Director Standards (Elect)-I, RDSO (*Alternate*)	
Shri P. G. Mathur	Army Headquarters
Shri P. Anantha Ram (*Alternate*)	
Shri A. K. Nagarkatti	Kirloskar Electric Co Ltd, Bangalore
Shri M. Ganesh (*Alternate*)	
Shri J. M. Naik	Millowners' Association, Bombay
Shri S. Sarup (*Alternate*)	

(*Continued on page* 2)

© *Copyright* 1980
INDIAN STANDARDS INSTITUTION

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(*Continued from page* 1)

Members	*Representing*
Shri J. S. Negi	Jyoti Ltd, Vadodara
Shri D. K. Kulkarni (*Alternate*)	
Dr M. S. Padhidri	Hindustan Brown Boveri Ltd, Bombay
Shri Y. D. Dosaj (*Alternate*)	
Shri D. P. Patel	Crompton Greaves Ltd, Bombay
Shri R. K. Taskar (*Alternate*)	
Dr G. M. Phadke	Indian Electrical Manufacturers' Association, Bombay
Shri K. P. R. Pillai	Fact Engineering & Design Organization, Udyogmandal
Shri V. Ramaswamy	Siemens India Ltd, Bombay
Shri S. N. Ghosh (*Alternate*)	
Shri K. N. Ramaswamy	Directorate General of Technical Development, New Delhi
Shri R. K. Gupta (*Alternate*)	
Shri Ramesh Chandra	Delhi Electric Supply Undertaking, New Delhi
Shri P. Dutta (*Alternate*)	
Shri A. S. R. Sastry	Bharat Heavy Electricals Ltd, Hyderabad
Shri N. P. Gupta (*Alternate* I)	
Shri S. C. Gofela (*Alternate* II)	
Shri P. K. Saxena	Rural Electrification Corporation Ltd, New Delhi
Shri G. L. Dua (*Alternate*)	
Shri G. B. Singh	Steel Authority of India Ltd, New Delhi
Shri P. C. Sengupta (*Alternate*)	
Shri D. N. Upadhyay	National Test House, Calcutta
Shri S. P. Sachdev, Director (Elec tech)	Director General, ISI (*Ex-officio Member*)

Secretary

Shri R. K. Monga
Deputy Director (Elec tech), ISI

Industrial Motors Subcommittee, ETDC 15 : 1

Convener	
Shri S. N. Ghosh	Siemens India Ltd, Bombay
Members	
Shri V. Ramaswamy (*Alternate* to Shri S. N. Ghosh)	
Shri A. V. Bapat	Bharat Bijlee Ltd, Bombay
Shri S. S. Bijlani	Walchandnagar Industries Ltd, Walchandnagar
Shri S. S. Kulkarni (*Alternate*)	
Shri J. L. Chhabra	Directorate General of Supplies & Disposals, New Delhi
Deputy Director, Inspection (*Alternate*)	

(*Continued on page* 18)

Indian Standard

SPECIFICATION FOR TEXTILE MOTORS

PART I LOOM MOTORS

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 27 December 1979, after the draft finalized by the Rotating Machinery Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 Motors required to drive textile machinery, especially looms, have special features, such as high starting torque, fluctuating load torque and frequent starting and stopping. The requirements of various loom users differ depending on the type of looms for which these motors are required. This standard is, therefore, prepared with a view to bringing about uniformity in these requirements so that interchangeability of motors of a particular rating of one make with that of another make is possible.

0.3 This standard was first issued in 1964 and covered the requirements of 6-pole and 8-pole loom motors. The dimensions and the frame assignments were made only for 6-pole motors up to 1·5 kW required for driving loom for light fabrics. This revision covers dimensions and frame assignments for 6-pole motors up to 2·2 kW and 8-pole motors up to 1·5 kW.

0.3.1 The earlier standard covered motors with class A, E and B insulation. In this revision, motors with class F insulation are added. At the same time, class A motors have not been deleted as some motor manufacturers in small scale sector are still manufacturing these types of motors; however, it has not been felt necessary to specify the relationship between output and frame size for class A motors. Frame assignments applicable earlier to class A have been revised and made applicable to class E and class B inslulated motors.

0.3.2 Since lug-mounted motors are normally used with cradles, in this revision the dimensions of lug-mounted motors are covered with cradles. Foot-mounted motors conforming to IS : 1231-1974* are widely used for loom application and dimensions and frame assignments are, therefore, added for foot-mounted motors also.

---

*Dimensions of three-phase foot-mounted induction motors (*third revision*).

0.3.3 Because of space restriction, the overall dimensions of the motor asssume great importance. Therefore, maximum overall dimensions are also specified.

0.4 Motors driving looms for heavy fabrics, such as woollen and canvas are of higher rating compared with motors driving looms for light fabrics, such as cotton, silk, rayon and nylon. The other requirements are generally similar.

Based on the experience gained in the country, in this revision the dimensions and frame assignment are made applicable for motors used on both these applications.

0.5 To ensure satifactory installation and maintenance of induction motors, the recommendations contained in IS : 900-1965* shall be followed.

0.6 This standard is one of a series of Indian Standard specifications for motors required by the textile industry. Other specifications so far in the series are:

IS : 2972 (Part II)-1979 Textile motors : Part II Card motors (*first revision*).

IS : 2972 (Part III)-1979 Textile motors : Part III Ring frame motors (*first revision*).

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2 1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers squirrel cage three-phase induction motors for driving textile looms on system voltage not exceeding 650 volts and having output ratings up to and including 3·7 kW.

1.2 This standard also specifies the dimensions and output frame assignments for class E, B and F insulated loom motors up to 2·2 kW for 6-pole (1 000 rev/min) and up to 1·5 kW for 8-pole (750 rev/min) motors.

---

*Code of practice for installation and maintenance of induction motors (*revised*).

†Rules for rounding off numerical values (*revised*).

1.3 The motors covered by this specification may have class A, E, B or F insulation with their associated temperature-rises as outlined in **12** of IS : 325-1978*.

2. TERMINOLOGY

2.1 For the purpose of this standard, definitions given in IS : 1885 (Part XXXV)-1973†, shall apply.

3. SITE CONDITIONS

3.1 For the purpose of this standard, the normal site conditions shall be in accordance with **3** of IS : 325-1978*.

4. TYPES OF ENCLOSURES

4.1 The degree of protection to be provided by enclosures shall be IP44 or superior (totally enclosed) in accordance with IS : 4691-1968‡.

5. METHOD OF COOLING

5.1 The method of cooling shall be IC0041 (totally enclosed without fan cooling) in accordance with IS : 6362-1971§.

NOTE — Fan cooled motors may also be used.

6. PREFERRED VOLTAGES, FREQUENCY, OUTPUT AND SPEED

6.1 Preferred Voltage — The preferred rated voltage shall be 415 V.

6.2 Preferred Frequency — The preferred rated frequency shall be 50 Hz.

6.3 Preferred Outputs — The preferred output ratings shall be 0·37, 0·55, 0·75, 1·1, 1·5, 2·2 and 3·7 kW.

NOTE — The motors with output of 0·95 kW may also be used.

6.4 Preferred Speeds — The preferred synchronous speeds for the purpose of this standard shall be 1 000 and 750 revolutions per minute (for 6 and 8 poles respectively).

---

*Specification for three-phase induction motors (*fourth revision*).

†Electrotechnical vocabulary: Part XXXV Rotating machinery.

‡Degrees of protection provided by enclosures for rotating electrical machinery.

§Designation of methods of cooling for rotating electrical machines.

7. STANDARD FRAME NUMBERS AND DIMENSIONS

7.1 The frame assignment and the dimensions of the motors shall be as given below:

a) Foot-mounted motors — Table 1, read with Fig. 1.
b) Flat base mounted motors — Table 2, read with Fig. 2.
c) Lug mounted motors with cradles — Table 3, read with Fig. 3.

7.2 Position of Terminal Box— The terminal box on a motor should be situated with its centre-line within a sector ranging from the top to 10 degrees below the horizontal centre-line of the motor on the right hand side, when looking at the driving end of the motor.

8. DUTY AND RATING

8.1 For the purpose of this standard, only duty type S_1 (continuous duty) shall be applicable (for details *see* **9.2** of IS : 4722-1968*).

9. EARTHING

9.1 Earthing of the motor shall be done in accordance with the relevant provisions of IS : 3043-1966†.

10. OVERLOAD

10.1 Momentary Excess Torque — The motors shall be capable of withstanding for 15 seconds without stalling or abrupt change in speed (under gradual increase of torque) 1·6 times of their rated torque, the voltage and frequency being maintained at their rated values.

10.2 Sustained Overload — Motors rated in accordance with this standard are not capable of carrying sustained overloads.

11. LIMITS OF VIBRATION

11.1 Unless otherwise specified, the double amplitude of vibration for the motors shall be within the nominal limits specified in IS : 4729-1968‡.

12. PERFORMANCE

12.1 Breakaway (Starting) Torque — With rated voltage and frequency applied to the terminals of the stator, motors shall develop a minimum breakaway (starting) torque of 230 percent of the full load torque for 6-pole motors and 200 percent for 8-pole motors.

NOTE — In case of clutch drive, motors with breakaway (starting) torque lower than those mentioned above may also be suitable.

---

*Specification for rotating electrical machines.

†Code of practice for earthing.

‡Measurement and evaluation of vibration of rotating electrical machines.

12.2 Pullout Torque — The minimum pullout torque of the motor shall be 270 percent of the full load torque for 6-pole motors and 230 percent for 8-pole motors.

12.3 Efficiency Power Factor and Slip — If efficiency, power factor and slip guarantees are required, the purchaser shall state, at the time of enquiry, the load at which he requires them, and these shall represent the values as obtained when the motor is tested under rated conditions and not under actual working conditions, since the loom load fluctuates widely and frequently and tolerances on such guarantees shall be in accordance with Table 2 of IS : 325-1978*.

13. TERMINAL MARKINGS

13.1 Terminal markings when used shall be in accordance with IS : 4728-1975†.

14. RATING PLATE

14.1 A rating plate stating the following shall be supplied with each motor:

a) Reference of this standard, that is, 'Ref ISS 2972 (Part I)';
b) The words induction motor;
c) Name of manufacturer;
d) Manufacturer's number and frame reference;
e) Type of duty;
f) Class of insulation;
g) Frequency in Hz;
h) Number of phases;
j) Rated output in kW;
k) Rated voltage and winding connections;
m) Current, approximate in amperes at rated output; and
n) Speeds in revolutions per minute at rated output.

14.1.1 The motors may also be marked with the ISI Certification Mark.

NOTE — The use the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

---

*Specification for three-phase induction motors (*fourth revision*).

†Terminal marking and direction of rotation of rotating electrical machinery.

15. INFORMATION TO BE GIVEN WITH ENQUIRY AND ORDER

15.1 The general information to be furnished when enquiring for the ordering an electrical motor is given in Appendix A.

16. TESTS

16.1 General — The tests specified in **16.3** shall normally be carried out at manufacturer's works.

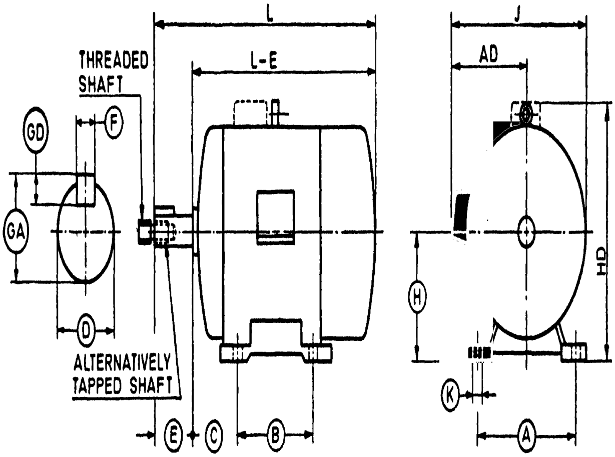
16.2 Test Certificates

16.2.1 Unless otherwise specified when inviting tenders, the purchaser, if so desired by the manufacturer, shall accept manufacturer's certificates as evidence of the compliance of the motor with the requirements of **7**, **10** and **12** of this standard together with the type test (*see* **16.3.1.1**) certificate on a motor identical in essential details with the one purchased, to other with routine tests on each individual motor. In the case when a batch of 20 or more similar motors is supplied on one order, type tests, as specified, shall be made on one of these motors, if the purchaser so requires.

16.2.2 Certificates of routine tests shall show that the motor purchased has been run and has been found to be electrically and mechanically sound and in working order in all particulars.

16.2.3 If so specified when inviting tenders, tests shall be carried out at the manufacturer's works in the presence of the purchaser or his representative to ensure that the motor complies in every respect with the requirements of **7**, **10**, **12** and **16.3** and to ascertain that the efficiency conforms to the guarantee, if any.

16.2.4 Certificates of all type tests together with a record of any alterations, whether essential or not, which have been made to the motor since the type tests were carried out, shall be kept available by the manufacturer for inspection.



All dimensions in millimetres.

FIG. 1 FOOT-MOUNTED LOOM MOTORS

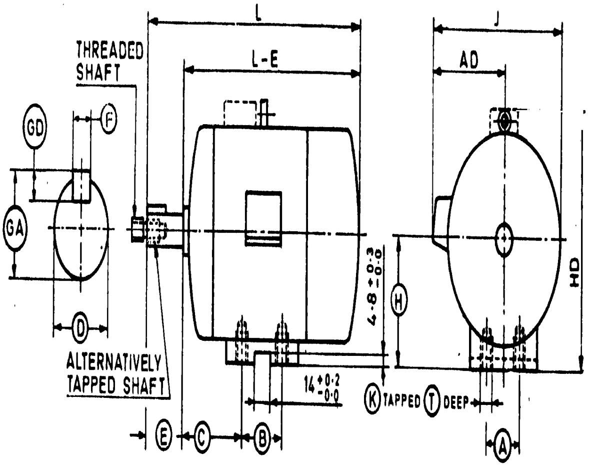
TABLE 1 FRAME ASSIGNMENT OF FOOT-MOUNTED LOOM MOTORS WITH CLASS OF INSULATION *E* OR *B*

(*Clauses* 1.2 *and* 7.1)

FRAME No.	OUTPUT (kW)		FIXING						SHAFT AND KEY						THREADED SHAFT	TAPPED SHAFT	OVERALL (MAX)*			
	6-Pole	8-Pole	*H*	Tol	*A*	*B*	*C*	*K*	*D*	Tolerance	*E*	*F*	*GD*	*GA*			*L–E*	*J*	*HD*	*AD*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
LR 90S	0·37	–	90	−0·5	140	100	56	10	24	J6 +0·009 −0·004	50	8	7	27	M 16 × 18 Length	M 8 × 19 Deep	235	280	265	175
LR 90L	0·55	0·37				125											260			
LR 100 L	0·75, 0·95	0·55	100	−0·5	160	140	63	12	28	J6 +0·009 −0·004	60	8	7	31	M 20 × 22 Length	M 10 × 22 Deep	285	310	290	190
LR 112M	1·1	0·75, 0·95	112	−0·5	190		70										300	340	320	205
LR 132S	1·5	1·1	132	−0·5	216	140	89	12	38	k6 +0·018 +0·002	80	10	8	41	M 24 × 28 Length	M 12 × 28 Deep	320	390	365	230
LR 132M	2·2	1·5				178											380			

*The overall dimensions *J* and *AD* are up to the outermost periphery of the motor, including cooling ribs when provided.

NOTE — Shaft extension may be provided with either threaded end or a tapped centre hole; threaded shaft extension should be provided with a suitable nut and spring washer.



All dimensions in millimetres.

FIG. 2 FLAT BASE MOUNTING LOOM MOTORS

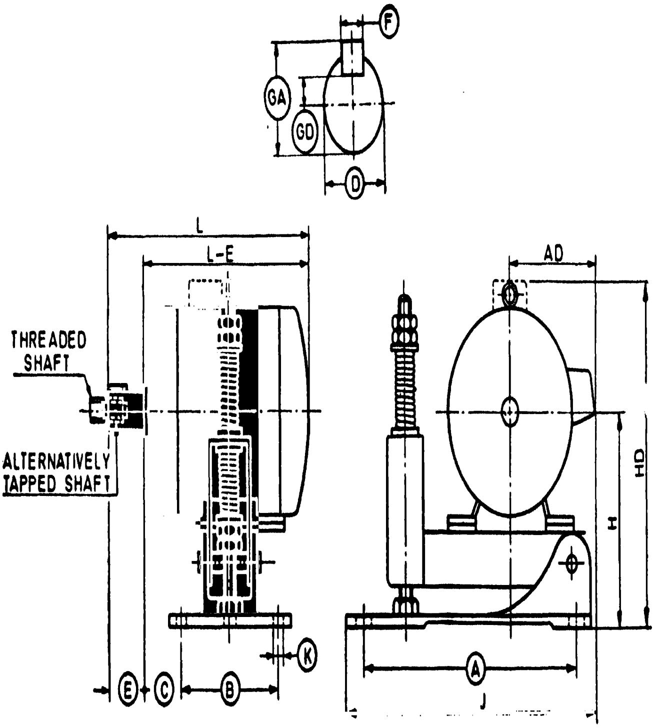
TABLE 2 FRAME ASSIGNMENT AND DIMENSIONS OF FLAT BASE MOUNTING LOOM MOTORS WITH CLASS OF INSULATION *E* OR *B*

(*Clauses* 1.2 *and* 7.1)

FRAME No.	OUTPUT (kW)		FIXING						SHAFT AND KEY						THREADED SHAFT	TAPPED SHAFT	OVERALL (MAX)*			
	6 Pole	8 Pole	*H*	Tol	*A*	*B*	*C*	*K* (Tapped) × *D* (Deep)	*D*	Tol	*E*	*F*	*GD*	*GA*			*L—E*	*J*	*HD*	*AD*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
LP 100L	Up to 0·75	0·95, 0·55	100	−0·5	100	50	108	M 16 × 20	28	j6 +0·009 −0·004	60	8	7	31	M 20 × 22 Length	M 10 × 22 Deep	285	310	290	190
LP 112M	1·1	0·75, 0·95	112			70	105										300	340	320	205
LP 132 S	1·5	1·1	132	−0·5	100	70	124	M 16 × 20	38	k6 +0·018 +0·002	80	10	8	41	M 24 × 28 Length	M 12 × 28 Deep	320	390	362	230
LP 132M	2·2	1·5					143										380			

*The overall dimensions *J* and *AD* are up to the outermost periphery of the motor, including cooling ribs when provided.

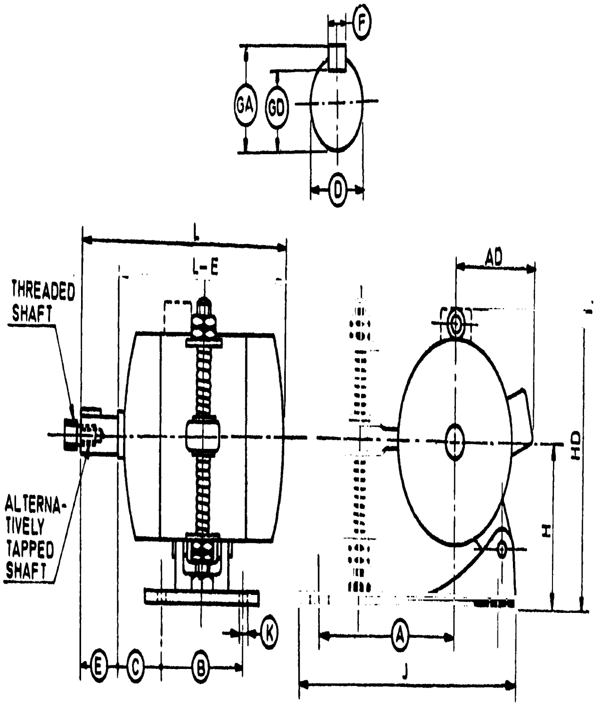
NOTE — Shaft extension may be provided with either threaded end or a tapped centre hole; threaded shaft extension should be provided with a suitable nut and spacing washer.



3A Frame No. LL 90 S to LL 100 L

All dimensions in millimetres.

FIG. 3 LUG MOUNTING LOOM MOTOR WITH CRADLE (*Continued*)



3B Frame No. LL 112 M to LL 132 M

All dimensions in millimetres.

Fig. 3 Lug Mounting Loom Motor with Cradle

TABLE 3 FRAME ASSIGNMENT AND DIMENSIONS OF LUG MOUNTING LOOM MOTORS WITH CRADLES HAVING CLASS OF INSULATION *E* OR *B*

(*Clauses* 1.2 *and* 7.1)

Frame No.	Output (kW)		Fixing					Shaft and Key						Threaded Shaft	Tapped Shaft	Overall (Max)†			
	6 Pole	8 Pole	*H**	*A*	*B*	*C*	*K*	*D*	Tolerance	*E*	*F*	*GD*	*GA*			*L–E*	*J*	*HD*	*AD*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
LL 90S	0·37	–	195	324	168	22	19	24	j6 +0·009 −0·004	50	8	7	27	M 16 × 18 Length	M 8 × 19 Deep	235	354	370	175
LL 90L	0·55	0·37				35										260			
LL 100L	0·75, 0·95	0·55	205	324	168	49	19	28	j6 +0·009 −0·004	60	8	7	31	M 20 × 22 Length	M 10 × 22 Deep	285	359	395	190
LL 112M	1·1	0·75, 0·95	183			56										300	415	388	205
LL 132S	1·5	1·1	199	363	168	75	19	38	k6 +0·018 +0·002	80	10	8	41	M 24 × 28 Length	M 12 × 28 Deep	320	553	429	230
LL 132M	2·2	1·5				93										380			

*'*H*' is not a rigid dimension. This dimension is for guidance only.

†The overall dimensions *J* and *AD* are up to the outermost periphery of the motor, including cooling ribs when provided.

Note – Shaft extension may be provided with either threaded end or a tapped centre hole; threaded shaft extension should be provided with a suitable nut and spacing washer.

16.3 Classification of Tests

16.3.1 Type Tests — The following shall constitute the type tests:

a) Measurement of stator resistance;

b) No-load running of motor and reading of voltage, current power input and speed;

c) Reduced voltage running-up test at no-load in each direction of rotation with $1/\sqrt{3}$ of the rated line voltage applied to the motor;

d) Locked-rotor readings of voltage, current, power input and value of torque of the motor;

NOTE — This test may be made at a reduced voltage.

e) Full-load reading of voltage, current, power input and slip;

f) Momentary overload test;

g) Temperature-rise test (*see* **22** of IS : 325 1978*);

h) High voltage test (*see* **23** of IS : 325-1978*);

j) Insulation resistance test, both before and after the high-voltage test (*see* **24** of IS : 325-1978*).

NOTE — For test methods covered in this standard, reference may be made to IS : 4029-1967†.

16.3.1.1 It is recommended that reports of type tests be made in the form given in Appendix B.

16.3.2 *Routine Tests* — The following shall constitute the routine tests:

a) Insulation resistance test, before high voltage test only (*see* **24** of IS : 325-1978*);

b) High-voltage test (*see* **23** of IS : 325-1978*);

c) No-load running of motor and reading of current in the three phases and voltage;

d) Locked-rotor readings of voltage, current and power input; and

e) Reduced voltage running up test at no-load to check the ability of the motor to run up to full speed in each direction of rotation with $1/\sqrt{3}$ of the rated line voltage applied to the motor.

---

*Specification for three-phase induction motors (*fourth revision*).

†Guide for testing three-phase induction motors.

APPENDIX A

(*Clause* 15.1)

INFORMATION TO BE GIVEN WITH ENQUIRY AND ORDER

When enquiring for and ordering the electric motor to comply with this standard the following particulars should be supplied:

1) Site and operating conditions.
2) Reference to this standard, that is, 'Ref ISS 2972 (Part I)'.
3) The type of enclosure.
4) The type of duty.
5) Frequency in Hz.
6) Number of phases.
7) Mechanical output in kW.
8) Rated voltage.
9) Class of insulation.
10) Speed in revolutions per minute, approximate, at the rated output.
11) Direction of rotation.
12) The maximum temperature of the cooling air in the place in which the motor is intended to work in ordinary service.
13) Maximum permissible temperature-rise of motor required, if different from this standard.
14) The altitude of the place in which the motor is intended to work in ordinary service, if it exceeds 1 000 m.
15) If a motor is required to operate between various limits of voltage, current, frequency or speed, the corresponding value of the voltage current, frequency and speed, respectively.
16) System of earthing, if any, to be adopted.
17) Particulars of tests required and where they are to be carried out.
18) Details of shaft extension required.
19) Method of starting to be employed.

20) Breakaway, torque in terms of the rated-load torque and the corresponding breakaway, starting current which may be taken from the supply with the starting apparatus in circuit.

21) Nature of load and any information regarding the driven machine which has a bearing upon the torque required during the accelerating period, the kinetic energy of the moving parts to be accelerated, and the number of starts during a specified period.

22) a) Mounting details, such as flat base or lug mounting; and
    b) Details of drive, such as belt or gear or clutch.

23) a) Particulars of cable connections required, and
    b) Direction of cable entry.

24) Any specific requirements.

Attention is directed to the utilization category of switching starter as specified in IS : 8544 (Part I)-1977*.

---

*Specification for motor starters for voltages not exceeding 1 000 V: Part I Direct-on-line ac starters.

APPENDIX B

(*Clause* 16.3.1.1)

FORM FOR TYPE-TEST REPORT OF THREE-PHASE SQUIRREL-CAGE INDUCTION MOTOR

Name and Address of the Manufacturer
As per IS : 2972 (Part I)-1979

Purchaser.... ....
Purchaser's Order No. ....

Certificate No. ....
Order Acceptance No. ....

Name-plate Data

kW Output	Synchronous Speed rev/min	Full Load rev/min	Phase Connection	Hz	Volts	Amperes Full Load	Enclosure	Rating	Frame	Temperature-Rise	Class of Insulation

Test Characteristics

Loading Condition	Volts	Amperes	Watts	Percent Slip	Load	Power Factor		Efficiency	
						Guaranteed	Test	Guaranteed	Test
No Load					—				
Load					$\frac{1}{2}$				
					$\frac{3}{4}$				
					$\frac{1}{1}$				

Temperature-Test Run

CONDITIONS OF TEST						TEMPERATURE-RISE IN °C STATOR	
Hours Run	Line Volts	Line Amperes	Watts Input	Calculated Output	Cooling Air Temp in °C	Core by Thermometer	Windings by Resistance or Thermometer

Breakaway Torque and Starting Current			Insulation and High Voltage Tests
BREAKAWAY STARTING (LOCKED ROTOR) TORQUE IN Nm WITH VOLTS APPLIED	BREAKAWAY STARTING CURRENT (LOCKED ROTOR) WITH VOLTS APPLIED	LOCKED-ROTOR WATTS WITH VOLTS APPLIED	INSULATION HIGH VOLTAGE
			STATOR

Resistance of stator winding per phase.................. ohms at.......................in °C

The motor runs up to full load speed at no load on both directions of rotation with.........Volts applied to tator.

Momentary overload for 15 seconds.........Test O.K.

Tests conducted on Machine No.............. ......

Tested by.......................on........................

Approved by..............

Date.........................

(*Continued from page* 2)

Members	*Representing*
Shri G. Dorairaj	The Coimbatore District Small Scale Industries Association, Coimbatore
Shri C. P. Dusad	Crompton Greaves Ltd, Bombay
Shri A. V. Wagle (*Alternate*)	
Shri S. C. Goella	Bharat Heavy Electricals Ltd, Hyderabad
Shri D. Basu (*Alternate* I)	
Shri P. V. Sathe (*Alternate* II)	
Shri H. G. Kamath	Voltas Ltd, Bombay
Shri M. L. Kothari	Indian Jute Mills' Association, Calcutta
Shri D. K. Kulkarni	Jyoti Ltd, Vadodara
Shri P. L. Pradhan (*Alternate*)	
Shri B. Mukhopadhyay	National Test House, Calcutta
Shri A. K. Nagarkatti	Kirloskar Electric Co Ltd, Bangalore
Shri K. G. Betigeri (*Alternate*)	
Shri Dhruv M. Naik	All India Electric Motor Manufacturers' Association, Bombay
Shri M. J. Naik (*Alternate*)	
Shri J. M. Naik	Millowners' Association, Bombay
Shri E. N. Narayanaswamy	Directorate of Industries & Commerce, Government of Tamil Nadu, Madras
Shri C. Natarajan (*Alternate*)	
Shri N. C. Nayak	Hindustan Steel Ltd, Ranchi
Shri A. K. Ghosh (*Alternate*)	
Dr M. S. Padbidri	Hindustan Brown Boveri Ltd, Bombay
Shri Y. D. Dosaj (*Alternate*)	
Dr G. M. Phadke	Indian Electrical Manufacturers' Association, Bombay
Shri N. Ramajayam	Indian Machine Tool Manufacturers' Association, Bombay
Shri M. Rangashai	Hindustan Machine Tools Ltd, Bangalore
Kumari Nirmala Naik (*Alternate*)	
Shri M. K. Sibbal	Gautam Electric Motors Pvt Ltd, New Delhi
Shri A. N. Srivathsa	NGEF Ltd, Bangalore
Shri S. A. Wajid (*Alternate*)	

AMENDMENT NO. 1 OCTOBER 1982
TO
IS:2972(Part I)-1979 SPECIFICATION FOR TEXTILE MOTORS
PART I LOOM MOTORS

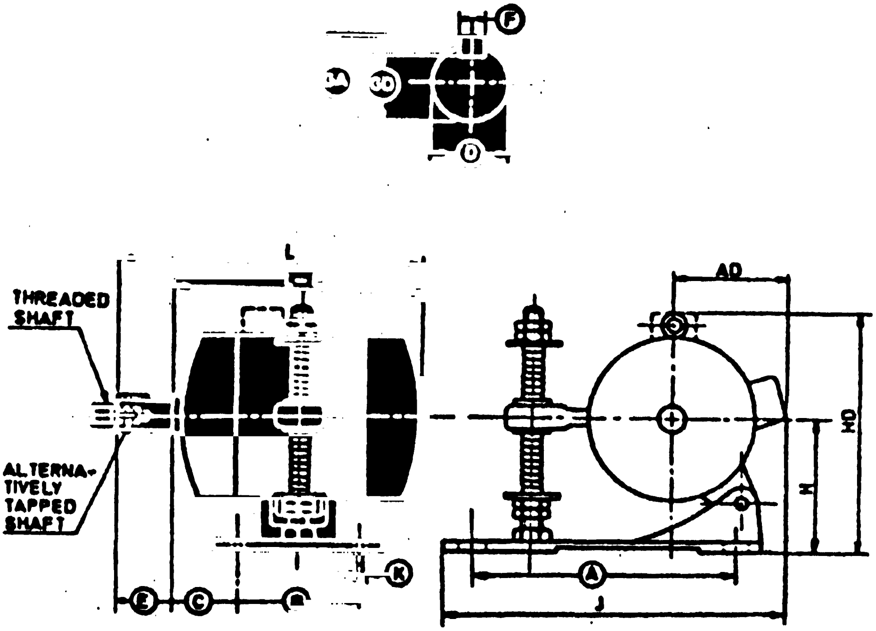
(First Revision)

Corrigendum

(*Page 12, Fig. 3B*) - Modify the arrow marks of dimensions *A* and *J* to indicate:

A - Centre to centre distance between fixing holes.

J - Overall width.



(ETDC 15)

3B Frame No. LL 112M to LL 132 M

Reprography Unit, ISI, New Delhi, India

AMENDMENT NO. 2 SEPTEMBER 1987

TO

IS:2972(Part 1)-1979 SPECIFICATION FOR TEXTILE MOTORS

PART 1 LOOM MOTORS

(*First Revision*)

(*Page* 10, *Table* 2, *col* 8) – Substitute the value of *C* in first entry as '$\frac{105}{108}$' *for* '$\frac{108}{105}$'.

(ETDC 15)

Reprography Unit, BIS, New Delhi, India

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

INDIAN STANDARDS INSTITUTION
Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002
Telephones : 26 60 21, 27 01 31 **Telegrams : Manaksanstha**

Regional Offices :

			Telephone
Western	: Novelty Chambers, Grant Road	BOMBAY 400007	37 97 29
Eastern	: 5 Chowringhee Approach	CALCUTTA 700072	27 50 90
Southern	: C. I. T. Campus, Adyar	MADRAS 600020	41 24 42

Branch Offices :

'Pushpak', Nurmohamed Shaikh Marg, Khanpur	AHMADABAD 380001	2 03 91
'F' Block, Unity Bldg, Narasimharaja Square	BANGALORE 560002	2 76 49
Gangotri Complex, Bhadbhada Road, T.T. Nagar	BHOPAL 462003	6 27 16
22E Kalpana Area	BHUBANESHWAR 751014	5 36 27
Ahimsa Bldg, SCO 82-83, Sector 17C	CHANDIGARH 160017	2 83 20
5-8-56C L. N. Gupta Marg	HYDERABAD 500001	22 10 83
D-277 Todarmal Marg, Banipark	JAIPUR 302006	6 98 32
117/418 B Sarvodaya Nagar	KANPUR 208005	8 12 72
Patliputra Industrial Estate	PATNA 800013	6 28 08
Hantex Bldg (2nd Floor), Rly Station Road	TRIVANDRUM 695001	32 27

Printed at Printograph, New Delhi, India